

Remarks

Initially, Applicant would like to thank Examiner Jones for discussing the present application with Applicant's representative.

Claims status

Claims 3-9, 11-18, 21-27, 29-38 and 49-57 are pending in the application.

35 USC 102 rejections

Claims 3-7, 9, 11-18, 21-25, 27, 29-38 and 49-52 were rejected under 35 USC 102(b) as being anticipated by KOICHI JP2003-282455. That rejection is respectfully traversed.

As pointed out to Examiner Jones in a telephone conversation on April 26, 2010, KOICHI has a publication date of October 3, 2003.

The present application claims priority to PCT/JP2003/012146 filed on September 24, 2003. Although the priority application was not filed in English, nevertheless, an English translation has subsequently been submitted to the USPTO to perfect Applicant's claim to priority (see form PCT/DOE/EO/903 mailed from the USPTO on October 13, 2006).

As applicant is entitled to the PCT filing date of September 24, 2003 and as this date is prior to KOICHI's October 3, 2003

date, KOICHI is not prior art. Thus, withdrawal of this rejection is respectfully requested.

Claims 53-57 were rejected under 35 USC 102(b) as anticipated by CHIU et al. 5,407,531. That rejection is respectfully traversed.

CHIU et al. do not disclose that the amount of the first gas and the second gas supplied is adjusted in such a manner that an absolute value for the rate of change of layer thickness becomes:

$|R| < |r_2| < |r_1|$. Please note that since $|r_2| < |r_1|$, values of zero would not meet the claim. Moreover, CHIU discloses 0.1-3 for r_1 .

The position set forth in the Official Action is that CHIU discloses a method of etching that can be performed in various ways that would satisfy the above relationship.

However, based on the disclosed values of CHIU, the above relationship is never attained.

CHIU discloses at column 3, lines 49-59, that "[d]uring the etching step, a gaseous constituent is also introduced into the chamber 10 from the source 20. Specifically, the source 20 is adapted to supply indium into the chamber. Illustratively, indium in gaseous form is so supplied either from trimethylindium or from a conventional elemental effusion cell. In any case, the quantity of the indium-containing gas introduced into the chamber via the injector 26 is controlled to be up to about 0.4 times

(illustratively, about 0.1 times) that of the etching gas introduced into the chamber by the injector 22."

Thus, CHIU et al. disclose that the quantity of the growth gas is controlled to be up to about 0.4 times that of the etching gas. CHIU et al. do not disclose the relationship between the etching rate (r_1), growth rate (r_2), and rate of change of the thickness of the semiconductor layer during implementation of the cleaning treatment step (R) as required to be anticipatory.

Moreover, if the quantity of etching gas in CHIU et al. corresponds to r_1 and the quantity of growth gas corresponds to r_2 , then a relationship among r_1 , r_2 , and R disclosed in CHIU et al. is:

$$|r_2| \leq 0.4 \times |r_1|, \text{ where } r_1 < 0 \text{ and } r_2 > 0. \quad |R| = |r_1 + r_2|$$

Based on the exemplary values disclosed by CHIU, if r_1 were equal to 1.0 (see column 3, lines 46-49 wherein 0.1-3 micrometers per hour may be employed), then r_2 would be up to 0.4 times this value. That is, 0.1 to 0.4.

Since $|R| = |r_1 + r_2|$, then R is between 1.0-0.1 and 1.0-0.4 or between 0.9 and 0.6. Thus, in CHIU, R (0.6 to 0.9) is greater than r_2 (0.1 to 0.4).

Similarly, if r_1 were equal to 3.0, then r_2 is between 0.3 and 1.2 and R is between 2.7 and 1.8.

Accordingly in CHIU, $|r_2| < |R| < |r_1|$.

In view of this, there is no value in CHIU that would satisfy that claimed relationship of $|R| < |r_2| < |r_1|$. Accordingly, CHIU does not anticipate the claims.

35 USC 103 rejection

Claims 3-9, 11-18, 21-27, 29-38, and 49-52 were rejected under 35 USC 103(a) as unpatentable over CHIU et al.

As set forth above, CHIU does not disclose that the amount of the first gas and the second gas supplied is adjusted in such a manner that an absolute value for the rate of change of layer thickness becomes:

$$|R| < |r_2| < |r_1|$$

Rather, as explained above following the teachings of CHIU would result in $|r_2| < |R| < |r_1|$. Since there does not appear to be any way to control the rates of CHIU to meet the present claims, then the recited relationship would not have been obvious in view of CHIU. In view of this, the claims avoid the rejection under 35 USC §103.

Applicants also note that CHIU corresponds to JP H8-97193 cited in the prosecution of the corresponding Japanese application before the Japanese Patent Office. The claims, as set forth above, were allowed and the Japanese patent has issued as number 4,186,489.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

/Liam McDowell/
Liam McDowell, Reg. No. 44,231
209 Madison Street, Suite 500
Alexandria, VA 22314
Telephone (703) 521-2297
Telefax (703) 685-0573

LM/dm